

Date: Wednesday, 28/01/2009 7:52:32 AM
 User: Liada Lacelle

Process Sheet

Customer :	CU-DAR001 Dart Helicopters Services	Drawing Name :	GLARESHIELD
Job Number :	45301		
Estimate Number :	13288		
P.O. Number :		Part Number :	D36901
This Issue :	28/01/2009	S.O. No. :	
Prsht Rev. :	NC	Drawing Number :	D3690 REVC
First Issue :	/ /	Project Number :	N/A
Previous Run :	41984	Drawing Revision :	C
	Type :	Material :	
	THERMOFORMING	Due Date :	06/02/2009
Written By :		Qty:	4
Checked & Approved By :		Um:	Each
Comment :	Est Rev A New Issue 08/04/28 DL verified by:DD Est Rev:B 08-07-14 revB as per dwg DD verified by:ec Est Rev:C 08-10-07 revC as per dwg DD verified by:EC		

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

1.0	MLEXS093F600602	GE PLASTICS LEXAN SHEET
-----	-----------------	-------------------------



Comment: Qty.: 26.3110 sf(s)/Unit Total : 105.2440 sf(s)

GE PLASTICS LEXAN SHEET

batch: ~~106751~~ 106751

09/02/10

M110877



(X4) (X6)

2.0	HAND FINISH TH	HAND FINISHING THERMOFORMING
-----	----------------	------------------------------



Comment: HAND FINISHING THERMOFORMING

Set up machine frame and program as per Folio FTA 019

09/02/10 BB 09/03/03

3.0	HAND FINISH TH	HAND FINISHING THERMOFORMING
-----	----------------	------------------------------



Comment: HAND FINISHING THERMOFORMING

1) Cut Blanks to fit frame size 69.5" X 35.5"

BB 09/03/03
09/02/10 (X4) (X6)

4.0	THERMOFORMING	THERMOFORMING MACHINE
-----	---------------	-----------------------



Comment: THERMOFORMING MACHINE

Thermoform as per Dwg. D3690-1and Folio FTA 019

BB 09/03/03 PTO. →
(X4) (X6)

Dwg. Rev. C

Folio Rev. B - Rev. C.

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D3690-1 PAR #: N/A Fault Category: Prod / thermoforming NCR: Yes No DQA: D Date: 09/03/04
 Resolution: Scrap Disposition: Scrap QA: N/C Closed: D Date: 09/03/04

NCR: <u>45301</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
09/02/10	4	3 UNITS SCRAP PULLED OUT OF CLAMPS		Scrap 3 UNITS THEN REWORK MOULD & Replace units.	09/03/03 Wt	09-03-04		09-03-04
09/03/03	4	1 UNIT SCRAP. ADJUST TEMP SETTING FOR MODIFIED MOULD.		Scrap 1 unit & Replace after adjust temp settings.	09/03/03 Wt	09-03-04		09-03-04
		RC: PROCESS						

NOTE: Date & initial all entries

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: GLARESHIELD

Job Number: 45301

Part Number: D36901

Job Number:



Seq. #:

Machine Or Operation:

Description :

5.0

QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

Visually inspect for proper formation of each part

BB 09/03/05 x6

6.0

QC8

SECOND CHECK



Comment: SECOND CHECK

09/03/03 x6

7.0

HAND FINISH TH

HAND FINISHING THERMOFORMING



Comment: HAND FINISHING THERMOFORMING

scuff for paint 09-03-11
09/03/04 x6

1) Trim to Finished Dimensions as per dwg D3690 using DT9036 / DT9043 template

8.0

QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

Check dimensions to ensure conformity to drawing tolerances.

09/03/04

9.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

02/03/05 x5 (PD) POSITIVE RECALL

10.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock
Location: CA

09/03/25

11.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

09/03/25

Job Completion



POSITIVE RECALL

EFFECTIVE 09-03-02 AUTH U

RELEASED DATE 09-03-09

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D3690-1 PAR #: _____ Fault Category: _____ NCR: Yes ☒ No ☐ DQA: D Date: 09/03/06
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR: 45301		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
2/8/04	9.0	on all 5 parts a mark about 1.25" x 1.25" x 0.005" deep on inside of glasshead. Rex. mould cavity		N/A see below				
09-03-04	9.0	checked all properly on 5 parts @ 4.250" from the windshield post cut out, there is a tiny indentation 0.003-0.005" deep, approximately 1.075" long. There was a tiny strand of fiber	PS/MLZ	Indentation to the is on the inside (not the exterior, and is almost impos- sible to see on the outside) and will be covered upon ass'y & paint.	BB 09/03/04	09/03-04	PS/MLZ	09/03-04
		glass from a glass cloth stuck to the mold. into R.C. Strand was not noticed upon forming. Note: Mold was blown off in between forms.	PS/MLZ	Acceptable Ensure to visually inspect the mold for debris more carefully.	BB 09/03/04	09/03-04	PS/MLZ	09/03-04

NOTE: Date & initial all entries

#1

DART AEROSPACE LTD		Work Order:	45301
Description: Glareshield		Part Number:	D3690-1
Inspection Dwg: D3690	Rev: B C <i>W</i>	Page 1 of 1	

FIRST ARTICLE INSPECTION CHECKLIST
☒ First Article ☐ Prototype
THERMOFORMING SECTION

Description	Accept	Reject	Method of Inspection	Comments
Shape Definition	✓			
Free of visual flaws (bumps, cracks, voids, etc.)	✓			

Measured by:

W

Date:

09/02/10

TRIMMING SECTION

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
2.20	+/-0.030	2.21	✓			
3.55	+/-0.030	3.57	✓			
0.040	Min	0.049	✓			

Measured by:

W

Date:

09/03/04

Audited by:

W

Date:

9/3/5

Prototype Approval:

N/A

Date:

N/A

Rev	Date	Change	Revised by	Approved
A	08.09.12	New Issue	KJ/DL <i>W</i>	<i>W</i>

#2

DART AEROSPACE LTD		Work Order: 45301
Description: Glareshield		Part Number: D3690-1
Inspection Dwg: D3690	Rev: B	Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

THERMOFORMING SECTION

Description	Accept	Reject	Method of Inspection	Comments
Shape Definition	✓			
Free of visual flaws (bumps, cracks, voids, etc.)	✓			

Measured by: *Wlu*

Date: 09/03/03

TRIMMING SECTION

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
2.20	+/-0.030	2.22	✓			
3.55	+/-0.030	3.55	✓			
0.040	Min	0.045	✓			

Measured by: *Wlu*

Date: 09/03/04

Audited by: *S*

Date: 9/3/5

Prototype Approval: N/A

Date: N/A

Rev	Date	Change	Revised by	Approved
A	08.09.12	New Issue	KJ/DL <i>af</i>	<i>DS</i>

3

DART AEROSPACE LTD		Work Order: 45301
Description: Glareshield		Part Number: D3690-1
Inspection Dwg: D3690	Rev: B	Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST
☒ First Article ☐ Prototype
THERMOFORMING SECTION

Description	Accept	Reject	Method of Inspection	Comments
Shape Definition	✓			
Free of visual flaws (bumps, cracks, voids, etc.)	✓			

Measured by: WHDate: 09/03/03**TRIMMING SECTION**

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
2.20	+/-0.030	2.21	✓			
3.55	+/-0.030	3.57	✓			
0.040	Min	0.045	✓			

Measured by: WHDate: 09/03/04Audited by: SDate: 9/3/5Prototype Approval: N/ADate: N/A

Rev	Date	Change	Revised by	Approved
A	08.09.12	New Issue	KJ/DL <u>af</u>	<u>DD</u>

#4

DART AEROSPACE LTD		Work Order:	45301
Description: Glareshield		Part Number:	D3690-1
Inspection Dwg: D3690	Rev: B	Page 1 of 1	

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

THERMOFORMING SECTION

Description	Accept	Reject	Method of Inspection	Comments
Shape Definition	✓			
Free of visual flaws (bumps, cracks, voids, etc.)	✓			

Measured by: dh

Date: 09/03/03

TRIMMING SECTION

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
2.20	+/-0.030	2.21	✓			
3.55	+/-0.030	3.58	✓			
0.040	Min	0.046	✓			

Measured by: dh

Date: 09/03/04

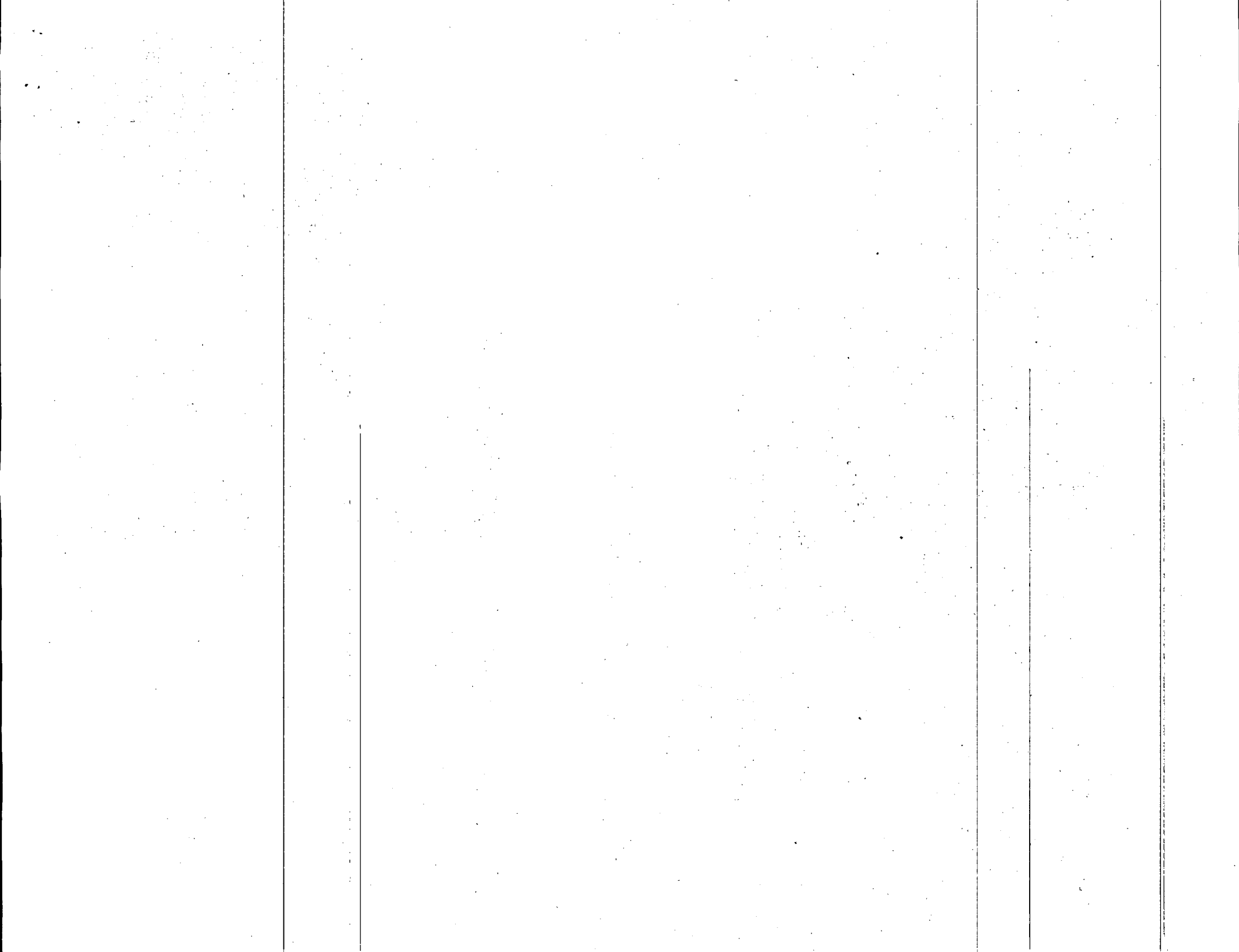
Audited by: S

Date: 7/3/15

Prototype Approval: N/A

Date: N/A

Rev	Date	Change	Revised by	Approved
A	08.09.12	New Issue	KJ/DL <u>dh</u>	<u>dh</u>



DART AEROSPACE LTD		Work Order:	45301
Description: Glareshield		Part Number:	D3690-1
Inspection Dwg: D3690 Rev: B			Page 1 of 1

☒ First Article ☐ Prototype

Description	Accept	Reject	Method of Inspection	Comments
Shape Definition	✓			
Free of visual flaws (bumps, cracks, voids, etc.)	✓			



09/03/03

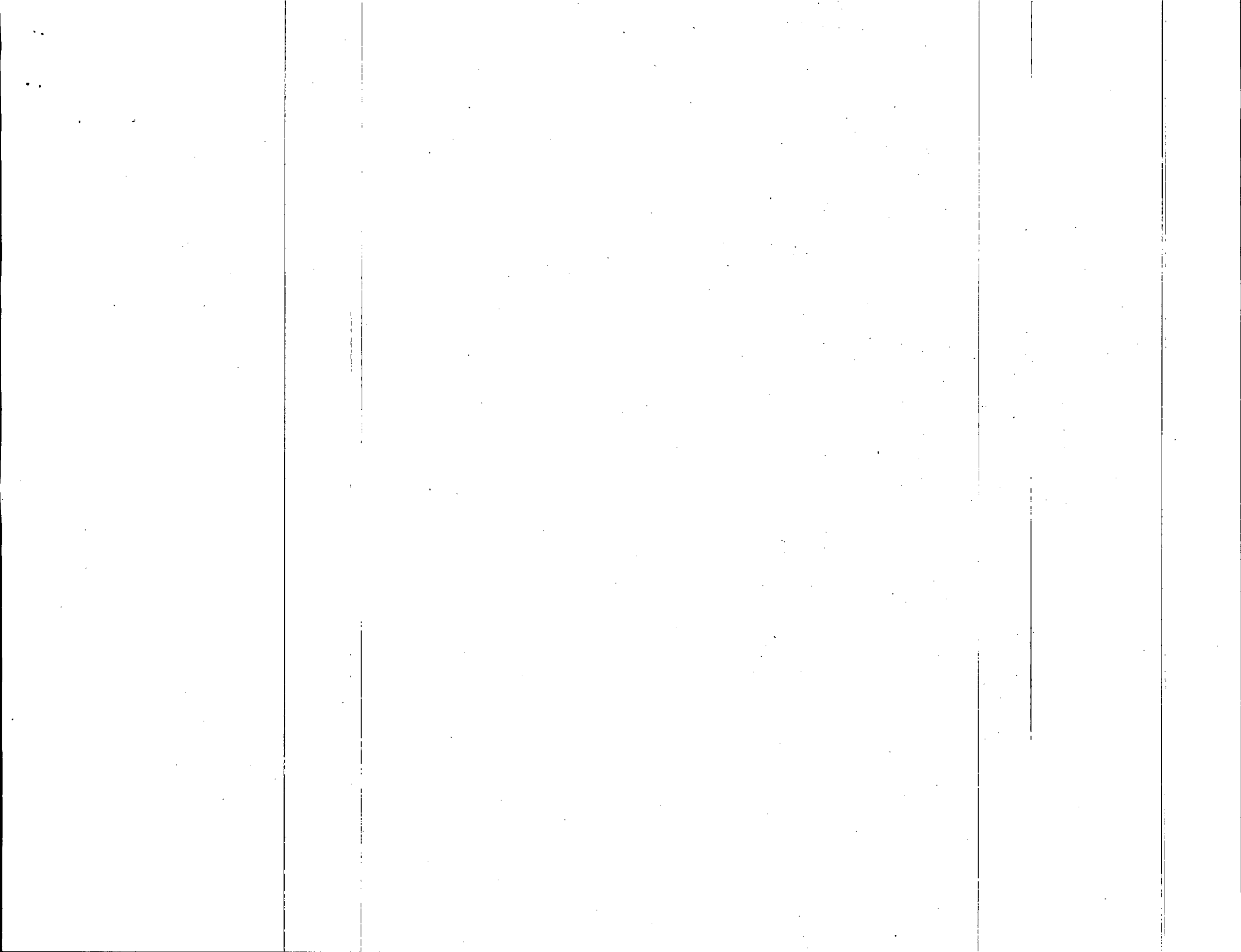
[illegible]

09/03/04

9/3/5

N/A

Rev	Date	Change	Revised by	Approved
A	08.09.12	New Issue	KJ/DL 	



#6

DART AEROSPACE LTD		Work Order:	45301
Description: Glareshield		Part Number:	D3690-1
Inspection Dwg: D3690	Rev: B	Page 1 of 1	

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

THERMOFORMING SECTION

Description	Accept	Reject	Method of Inspection	Comments
Shape Definition	✓			
Free of visual flaws (bumps, cracks, voids, etc.)	✓			

Measured by: Wk

Date: 09/03/03

TRIMMING SECTION

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
2.20	+/-0.030	2.19	✓			
3.55	+/-0.030	3.54	✓			
0.040	Min	0.046	✓			

Measured by: Wk

Date: 09/03/04

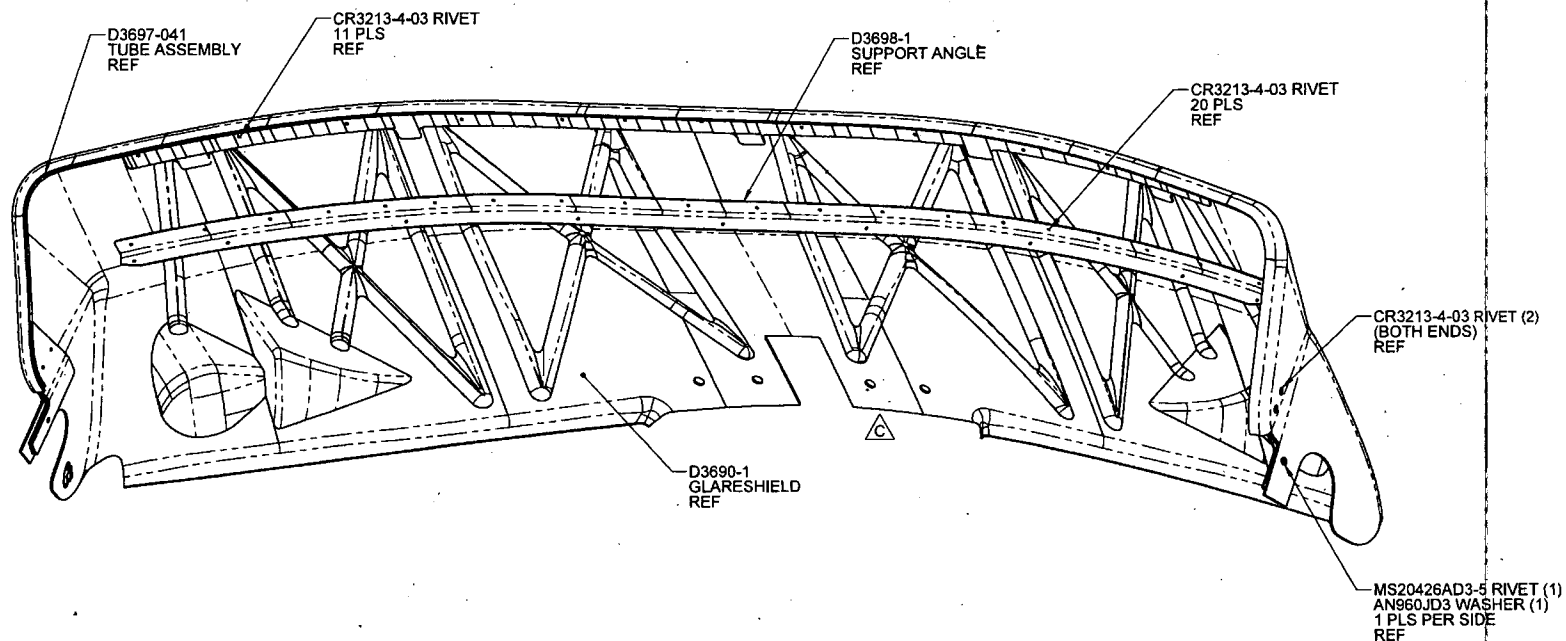
Audited by: S

Date: 7/03/05

Prototype Approval: N/A

Date: N/A

Rev	Date	Change	Revised by	Approved
A	08.09.12	New Issue	KJ/DL <u>AK</u>	<u>DD</u>



PART LIST

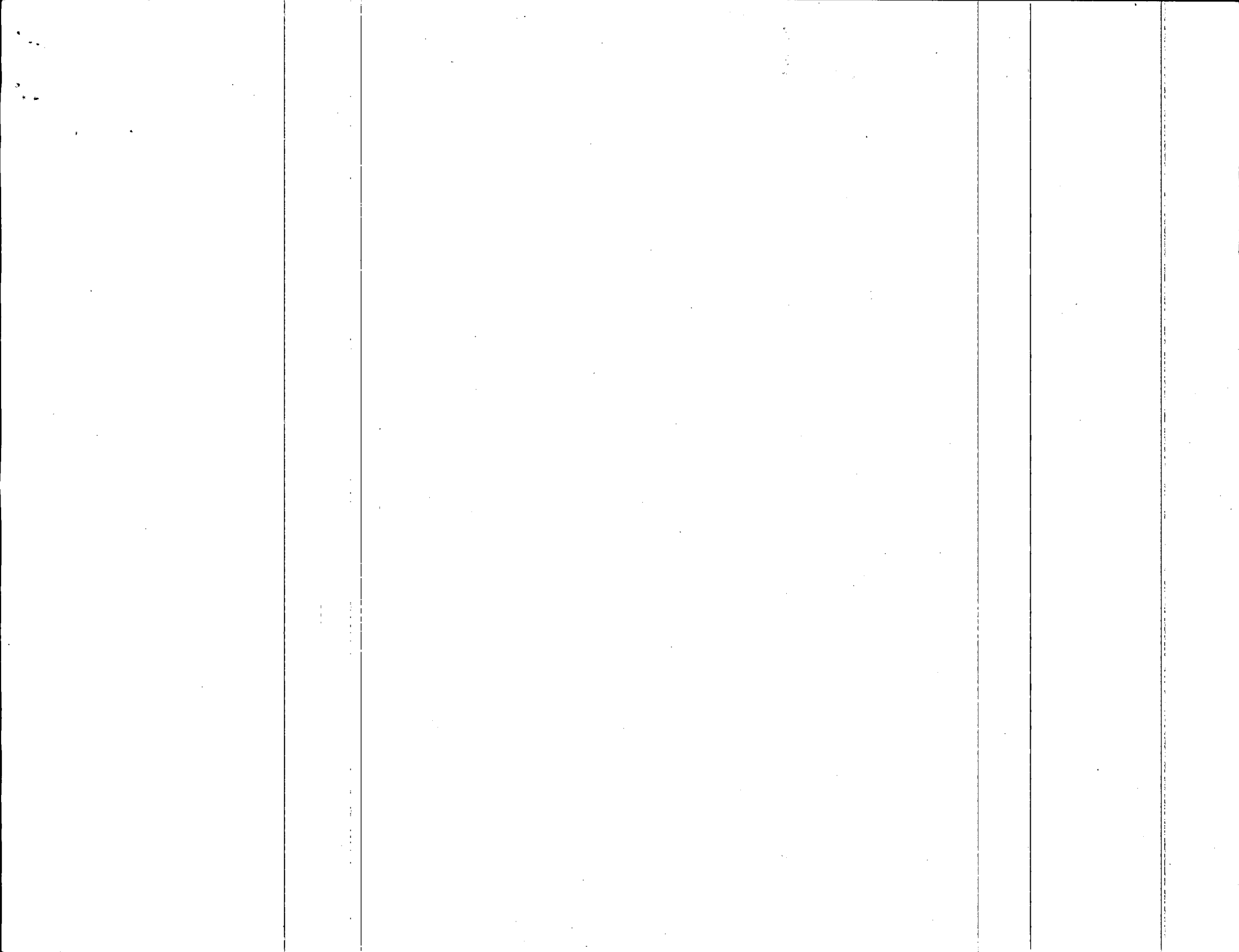
QTY -041	PART NUMBER	DESCRIPTION
X	D3690-041	GLARESHIELD ASSEMBLY
1	D3690-1	GLARESHIELD
1	D3697-041	TUBE ASSEMBLY
1	D3698-1	SUPPORT ANGLE
2	AN960JD3	WASHER (OR NAS1149DN332J)
2	MS20426AD3-5	RIVET
35	CR3213-4-03	RIVET

D3690-041 GLARESHIELD ASSEMBLY

45301

RELEASED
28.09.02

C	SHEET 1 PL MS20426AD3-5 RIVET WAS MS20426AD3-4, CR3213-4-03 RIVET WAS MS20470AD3-4, WASHER QTY WAS 6 (VIEWS UPDATED ACCORDINGLY). RIVETS ON SHEET 1 CHANGED TO REF QTY. RIVETS ON SHEET 2 CHANGED TO "HARD" CALLOUTS. SHADING REMOVED FROM ALL VIEWS FOR CLARITY.	AJS	08.09.02
B	ADD FINISH COAT & 1.0 TYP. SHEET 2 ZONES A, B & C.5; ADD MIN THICKNESS. SHEET 3 ZONE A.8	RF	08.06.24
A	NEW ISSUE	RF	08.05.26
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	<i>[Signature]</i>	DRAWING NO.	REV. C
MFG. APPR.	<i>[Signature]</i>	D3690	SHEET 1 OF 3
APPROVED	<i>[Signature]</i>	TITLE	SCALE
DE APPR.	<i>[Signature]</i>	GLARESHIELD ASSEMBLY	NTS
DATE	08.09.02	<small>COPYRIGHT © 2001 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	



8 7 6 5 4 3 2 1

TRANSFER DRILL $\varnothing 0.128$
FROM D3698-1 TO D3690-1
INSTALL
CR3213-4-03 RIVET, 20 PL
RIVET HEAD ON GLARESHIELD
OUTSIDE SURFACE

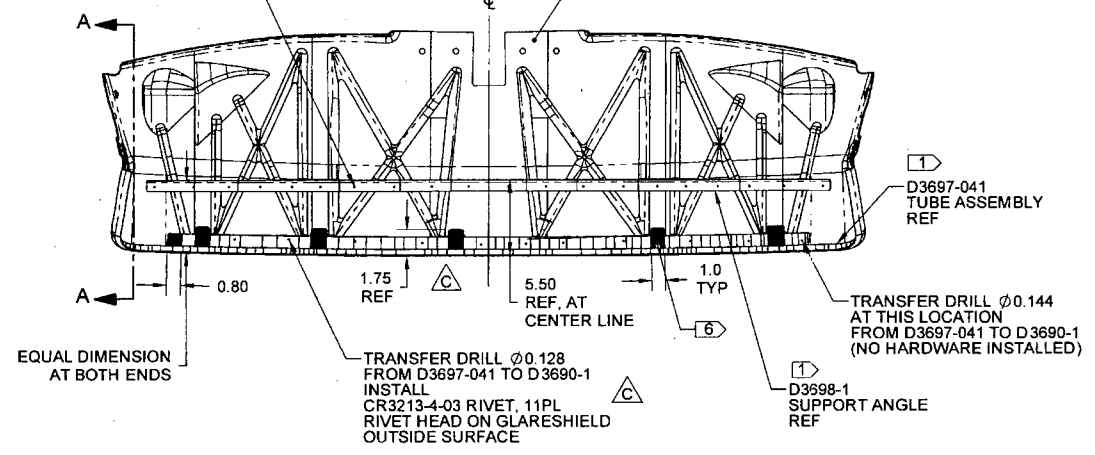
D3690-1
GLARESHIELD
REF

TRANSFER DRILL $\varnothing 0.098$
FROM D3697-041 TO D3690-1
INSTALL
MS20426AD3-5 RIVET
AN960JD3 WASHER (ON GLARESHIELD
OUTSIDE SURFACE)
1 PER SIDE

TRANSFER DRILL $\varnothing 0.128$
FROM D3697-041 TO D3690-1
INSTALL
CR3213-4-03 RIVET 2
BOTH ENDS

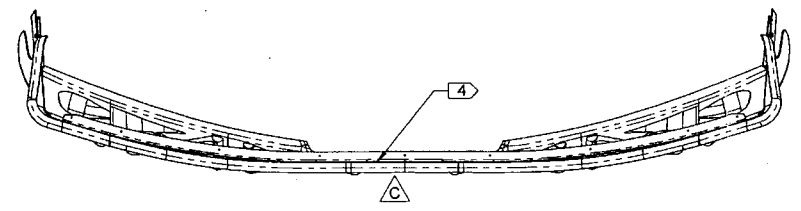
0.14
REF

SECTION A-A



EQUAL DIMENSION
AT BOTH ENDS

TRANSFER DRILL $\varnothing 0.128$
FROM D3697-041 TO D3690-1
INSTALL
CR3213-4-03 RIVET, 11PL
RIVET HEAD ON GLARESHIELD
OUTSIDE SURFACE



D3690-041 GLARESHIELD ASSEMBLY

45301

RELEASED
08-09-11

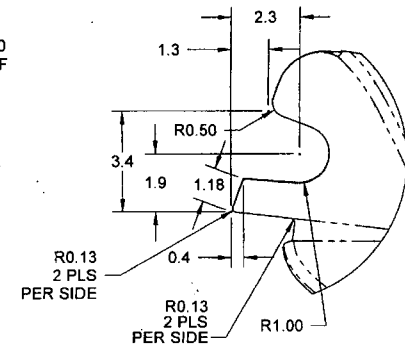
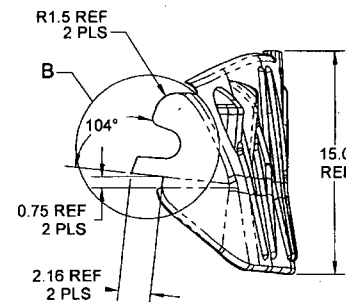
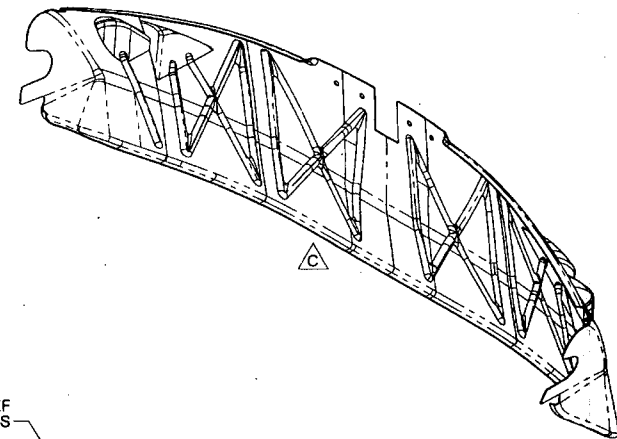
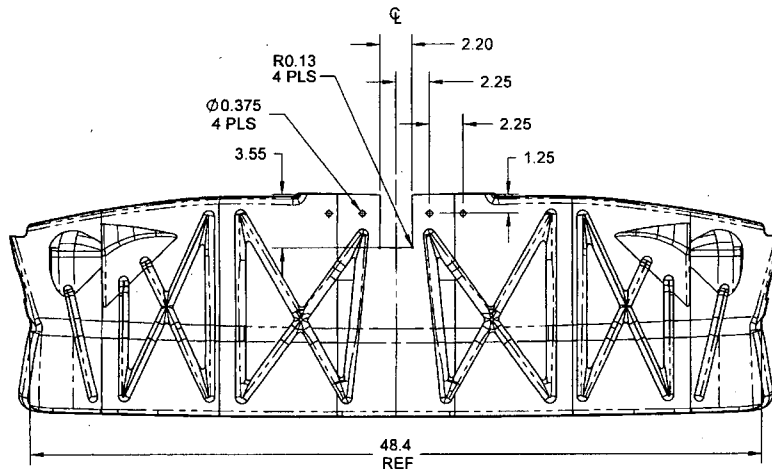
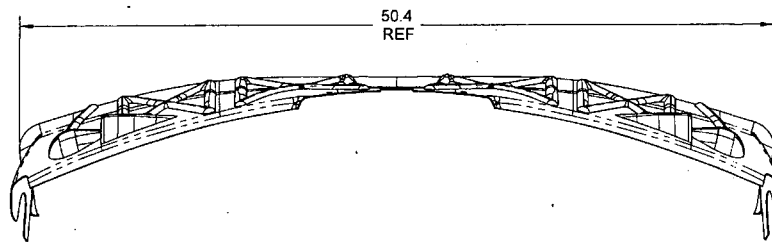
NOTES:

- 1) CENTER D3697-041 AND D3698-1 ON TO D3690-1
- 2) FINISH: PAINT D3690-041 ASSY FLAT BLACK USING BASF GLASURIT 22 LINE CODE SFA39.50 PER DART QSI 005 4.2
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) IDENTIFICATION: ETCH WITH DART P/N D3690-041 & B/N ON INSIDE OF PART
- 5) WEIGHT: 2.98 lbs
- 6) MASK HATCHED AREAS (6 PLS) ON INSIDE OF THE PART PRIOR TO PAINTING

DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO. D3690	REV. C
MFG. APPR.		SHEET 2 OF 3	
APPROVED		TITLE	SCALE
DE APPR.		GLARESHIELD ASSEMBLY	NTS
DATE	08.09.02	COPYRIGHT © 2008 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD	

8 7 6 5 4 3 2 1





D3690-1 GLARESHIELD





NOTES:

- 1) MATERIAL: F6006 SUEDE/POLISHED 701 BLACK FLAT LEXAN SHEET 0.093 THICK
(REF DART SPEC MLEXS.093-F6006-02)
- 2) TOOLING: THERMOFORM PER MOLD DT9010 PER QSI 022
TRIM PER MOLD SCRIBE LINES EXCEPT WHERE NOTED
- 3) FINISH: NONE
- 4) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 5) UNITS: INCHES UNLESS OTHERWISE NOTED
- 6) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 7) IDENTIFICATION: NONE
- 8) WEIGHT: 2.5 lbs
- 9) MINIMUM THICKNESS AFTER FORMING IS 0.040

RELEASED
02-07-14 110

DETAILB

SCALE 2X
THIS VIEW FOR REFERENCE ONLY

DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. C
MFG. APPR.		D3690	SHEET 3 OF 3
APPROVED		TITLE	SCALE
DE APPR.		GLARESHIELD ASSEMBLY	NTS
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Peter Hum

From: David Shepherd [dshepherd@dartaero.com]
Sent: Wednesday, March 04, 2009 6:42 PM
To: 'Peter Hum'
Subject: RE: D412-761 Glareshield deviation

Peter,

I agree that this is an acceptable deviation for the reasons you have outlined in your email.

David

From: Peter Hum [mailto:phum@dartaero.com]
Sent: Wednesday, March 04, 2009 1:31 PM
To: 'David Shepherd'
Subject: D412-761 Glareshield deviation

David,

There was a small piece of fiberglass in the mold of the Glareshield that showed up on the formed part. The deviation is in the underside of the glareshield hidden from the pilot's eye behind the instrument cluster.

See attached.

I believe this is an acceptable deviation b/c it cannot be seen when installed onto the aircraft and will not interfere with operations....Do you concur?

Peter

No virus found in this incoming message.

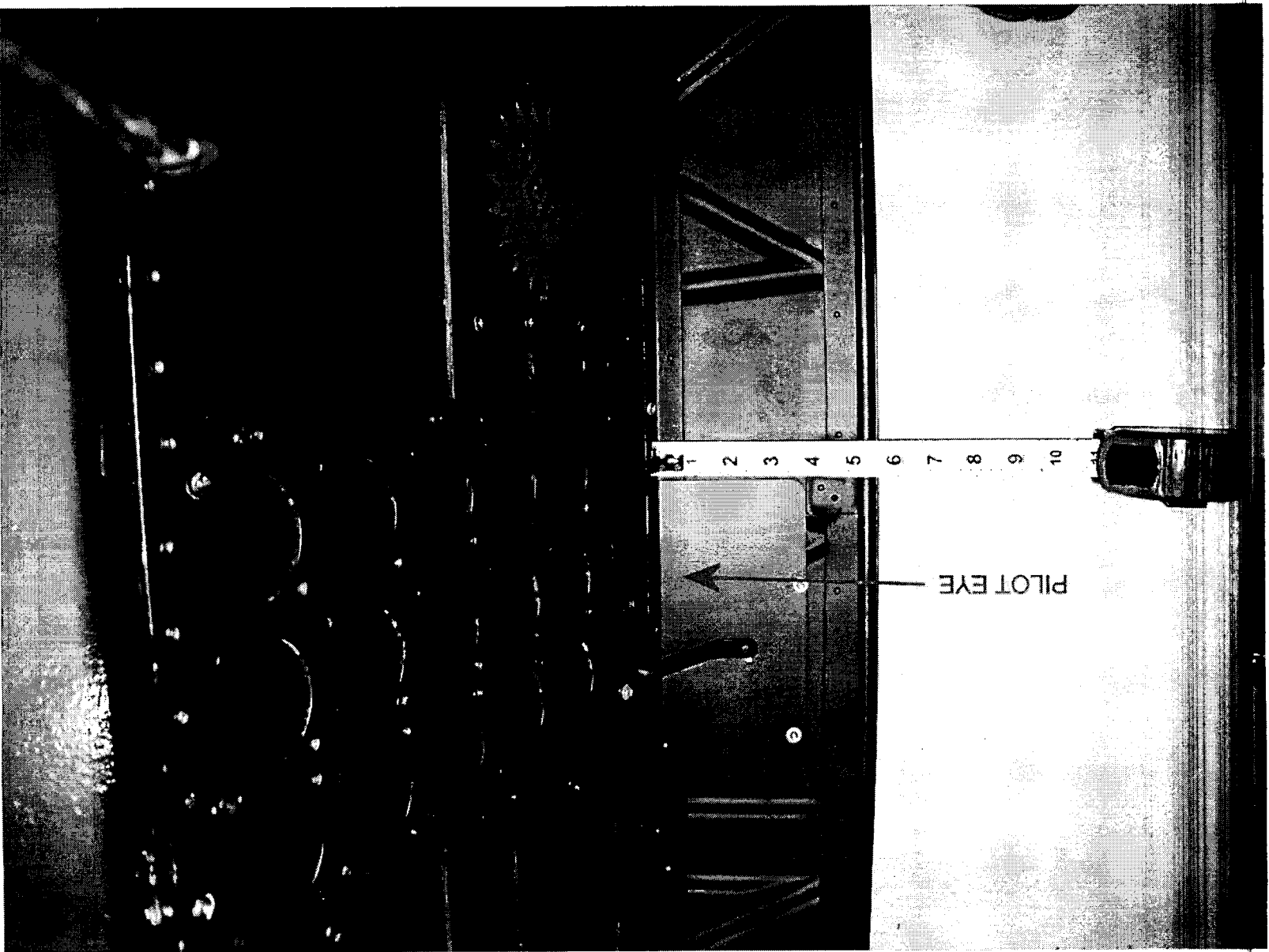
Checked by AVG.

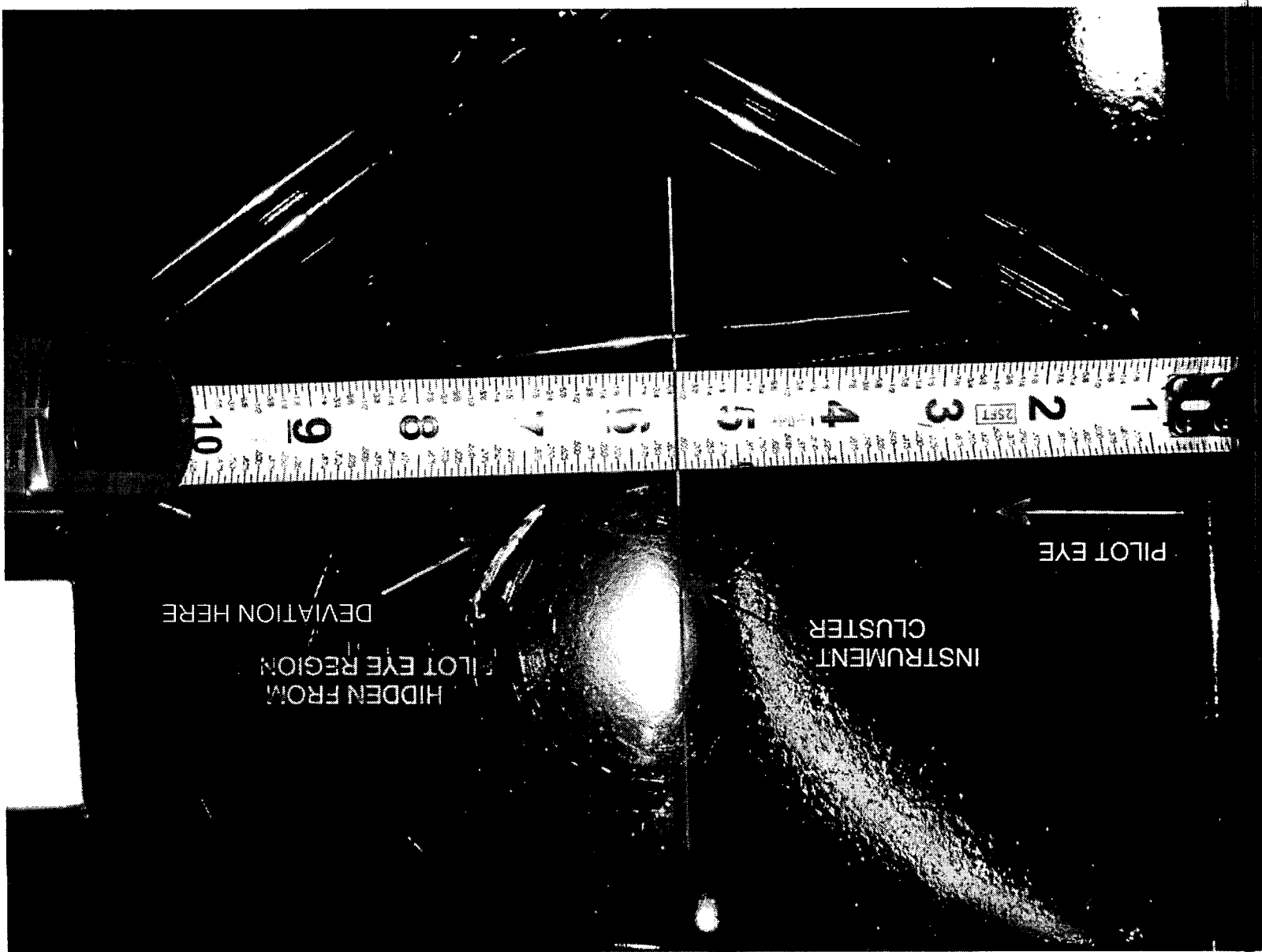
Version: 7.5.557 / Virus Database: 270.11.7/1983 - Release Date: 3/4/2009 7:41 AM

No virus found in this outgoing message.

Checked by AVG.

Version: 7.5.557 / Virus Database: 270.11.7/1983 - Release Date: 3/4/2009 7:41 AM





PILOT EYE

INSTRUMENT
CLUSTER

HIDDEN FROM
PILOT EYE REGION
DEVIATION HERE